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FAA general aviation NEWS

MAY—JUNE 1985

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U.S. Department of Transportation
Federal Aviation Administration

FAA GENERAL AVIATION NEWS

MAY-JUNE 1985
Volume 24, Number 3

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BRIEFS

TURBO NOT TURBINE. Several misfueling accidents have occurred when line personnel mistook the word "Turbo" lettered on the cowling to mean turbine-powered (requiring Jet A fuel). Recently Piper Aircraft issued Service Bulletin No. 798 calling for the removal of the lettering. Prompt compliance by owners will reduce fueling errors that have led to costly and fatal engine failures.

BIRDS AND BEES. Spring is the time when pilots need to add birds and bees to their preflight checklists. Bird and insect nests can clog engine and instrument air intakes and jam control cables. Their inhabitants can interfere with pilots in the cockpit. Looking out for pests on preflight--even when the airplane has only been sitting a few hours--can keep you from getting "stung" in flight.

SMOKING PILOTS. Pilots considering the "cold turkey" approach to quit smoking are advised to be careful about flying during the withdrawal period. Abrupt deprivation of nicotine can temporarily bring on physical sensations that may be distracting in the cockpit.

HOURS SLASHED FOR IFR TICKET. Effective June 7 the the total flight time required for an instrument rating on a private pilot certificate (with appropriate aircraft ratings) has been reduced from 200 hours to 125. Of that time 50 hours must be pilot-in-command cross-country. Each cross-country flight must include a landing more than 50 nautical miles from the original departure point. All other requirements of FAR §61.65 remain the same. See the next issue of FAA GENERAL AVIATION NEWS for details.

PAPI STANDARD. FAA Administrator Donald Engen has announced adoption of the Precision Approach Path Indicator (PAPI) as the ". . . preferred approach path technology for future federal support for airports." VASI and other glide slope systems will be permitted to remain in use, but PAPI will be the Federal standard.

The Administrator cited the advantages to pilots when they use standardized, familiar information signals during the approach to land.

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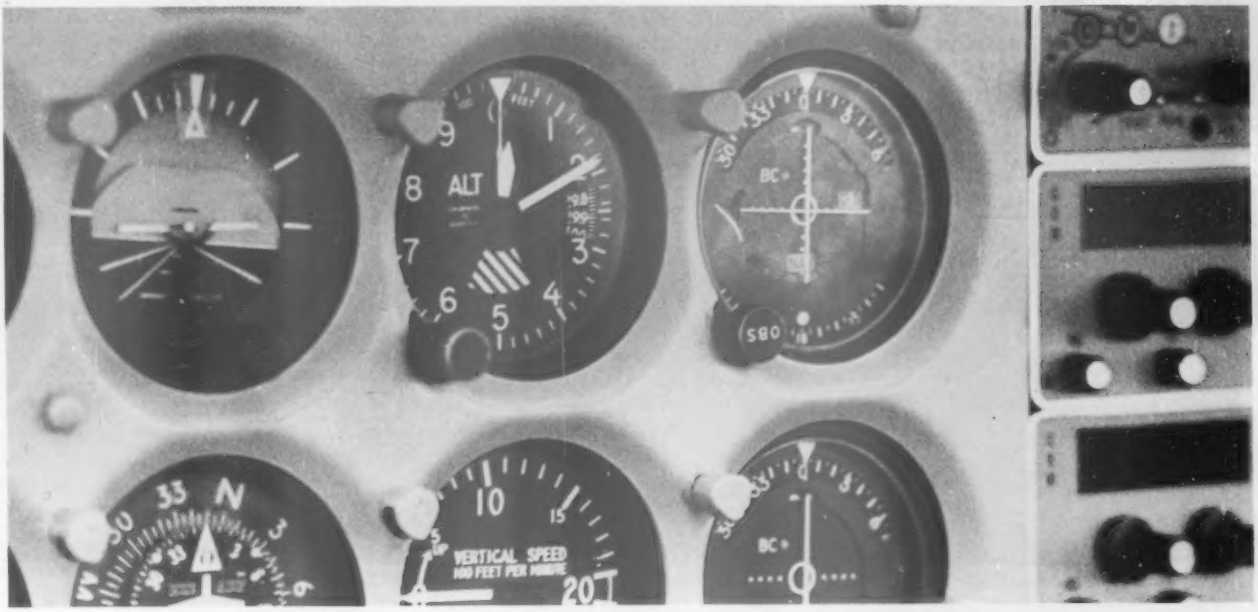

Keeping Tabs on Your Altimeter

The pressure altimeter is one of the most conspicuous instruments in the cockpit panel. It has a distinct advantage over other instruments in that its relative accuracy can be easily verified on the ground, when the field elevation is known, before flight is undertaken; and also during flight if the aircraft has an altitude encoding transponder and the aircraft is within radio range of an air traffic facility. It is extremely dependable. But it is also one of the easiest instruments to misread or misinterpret or misuse, with consequences that range from a botched-up landing to uncomfortably close encounters with other aircraft.

Altimeter failure is seldom listed as a probable cause in the official accident files, but there are many instances of fatal accidents attributed to loss of control, or disorientation, or poor judgment which might be related to altimeter problems if all the circumstances leading up to the accident could be known.

Although the dial of the modern altimeter is calibrated in 20′ increments, it would be naive to expect such accuracy with respect to height above ground during flight at low altitude, or while landing or taking off. Altimeter indications are useful during the initial approach and entrance into the airport pattern, but a discrepancy of 50′ to 100′ would be quite common in an aircraft not qualified for instrument flight.

This means that you would have to expect other aircraft in or entering the pattern to be somewhat higher or lower than you—not at the same precise height above the field. Mid-air accident reports in which the surviving pilot states that he or she did not see the other aircraft while maneuvering in the pattern are sometimes due to a failure to search for traffic underneath or above.

Landing undershoots or overshoots or just plain collisions with hard ground sometimes occur as a consequence of VFR pilots over-relying on altimeter information during the final segment of the landing approach, under conditions of reduced visibility. Altitude call-outs at turning points in the pattern are useful, but the pilot must rely on what he sees outside the cockpit to maintain a proper safe distance over the terrain. Using the altimeter as a "poor man's substitute" for a glide slope indicator is a dangerous practice, which could be justified only by an emergency situation. Otherwise, if ground reference visibility is not solid VFR, the approach should be broken off and the landing made at another airport.

A recent accident at Mitchellville, MD, outside Washington, DC, provides an interesting example of altimeter misuse. According to the National Transportation Safety Board report, the pilot of a Mooney M20K was returning from a visit to Atlantic City on the evening of May 28, 1983. The airman had logged over 2,000 hours, 197 in type and 164 hours at night. On this flight en route conditions were described as ". . . good VFR, with scattered rain showers." The pilot also reported noticing unusual fluctuation in the vertical speed indicator and sluggish movement of the altimeter. Nevertheless he elected to continue toward his destination, Freeway Airport, after receiving the latest weather observation and altimeter setting from Baltimore tower at 9:15 p.m.

Freeway has a single, north/south runway, 2,150′ in length and 30′ wide. There is a large clump of trees at the south end and no overrun. At the north end, approximately 75 feet from the runway pavement, there is a divided highway (Route 50) located in a cut 18′ below the runway. On the bank above the cut there is a chain link fence. The airport has a non-standard VASI, runway lights, and a lighted wind sock. It is not attended after dark.

The Mooney pilot made a pattern approach for a landing to the south. On final approach the pilot observed that "I was lower than I should be. . . (but) altitude and airspeed readings were normal for a short field dark night final."

The Mooney struck the chain link fence with the propeller, landing gear and fuselage. The gear collapsed and the aircraft bounced

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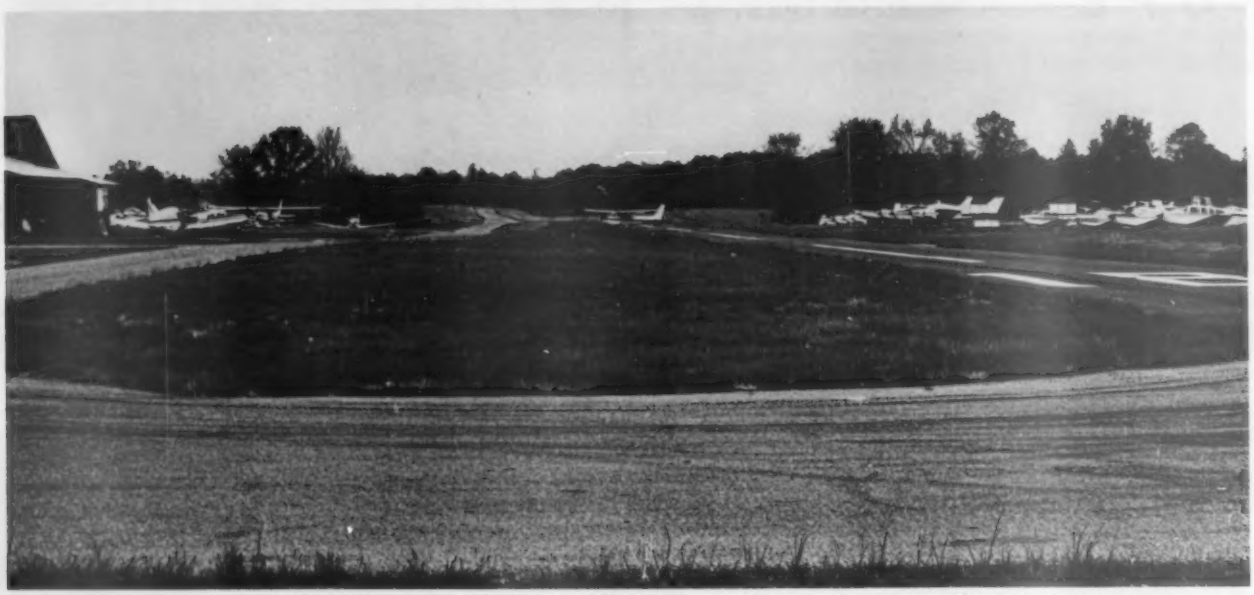


Freeway Airport, with trees to the south and wires near the north end. Mooney pilot landed short on chainlink fence.

and slid up to the runway. There was no fire, and the pilot reported no injuries. In discussing with Safety Board investigators the circumstances which contributed to the accident the airman mentioned a last minute wind shear; also the difference between the altimeter reading at rest, 215′, and the actual elevation of the field, 160′.

However, the Board's finding was that the pilot's failure to maintain ground clearance and a proper glidepath was the probable cause of the accident. Investigators pointed out that the pilot had adequate advance warning of problems with instruments dependent on the static air system, and the airspeed and altimeter readings could have been grossly in error during the landing.

Even with normally functioning instruments, landing a sophisticated airplane like the Mooney on that small, narrow runway on a dark, damp night was considered marginally safe by local experienced pilots (several such airmen had lost their lives attempting it). Baltimore or National Airport, with large, well-lit runways and radar guidance, was only minutes away.

All things considered the Mooney pilot was very lucky.

Less fortunate was the pilot of a Cessna 210 *Centurion*, who departed Gage, OK with known altimeter deficiency, following a daylong flight from Austin, TX, in early April.

The pilot, with 890 hours overall and 54 in type, landed at Gage in northwestern Oklahoma early in the evening for fuel. While the aircraft was being serviced the pilot talked with the airport manager about his altimeter, which appeared to be stuck at 8,200′ (local field elevation at Gage was 2,223′). Maintenance assistance was not available before the following day. The pilot was offered a ride to a motel or a couch to sleep on at the airport, but he declined.

According to the National Transportation Safety Board's investigation, the pilot contacted Gage FSS and requested the weather en route to Scottsbluff, NE.

The forecast for Nebraska called for "isolated light rain showers developing in the afternoon . . . surface wind from 300 degrees to 20 knots gusting to 30 knots . . ." The overall outlook indicated minimum VFR conditions in the western portion (including Scottsbluff); VFR elsewhere. The pilot informed Gage FSS that he was IFR qualified but that he could not file IFR because of altimeter malfunction. The Cessna 210 departed Gage at approximately 6:30 p.m.

Shortly after 9:00 p.m. the pilot contacted Scottsbluff FSS via the Sidney, NE, VOR, located about 50 miles south of Scottsbluff, and asked for a weather observation. The FSS was reporting ceiling 2,000′ overcast, visibility three miles in light snow. Unofficial witnesses on the ground stated that apparently a narrow band of extremely heavy, wet snowfall existed between Sidney and Scottsbluff at this time. The terrain around Sidney consists of rolling hills and prairies, occupied by large ranches and wheat farms.

There was no further ATC contact with this aircraft. Following reports of a low-flying airplane over Sidney that night and no confirmation of the 210's arrival at Scottsbluff, a search effort was launched the next morning. Wreckage was found in an open wheat field, scattered over three acres. The pilot was fatally injured on impact. On site investigation suggested that at the time of the crash the pilot had initiated a turn in order to retreat from the heavy snow shower, but had no means of judging his altitude above the ground.

The basic pressure altimeter for aircraft has changed little over the years. Its "heart," or basic component, is a series of hollow, metallic wafers joined together by flexible material, somewhat like an accordion bellows. As the air pressure changes, this device expands or contracts, and in so doing moves a geared arm which is attached to the altitude pointers on the dial face.

All aircraft except some of the older models are equipped with what is called a *sensitive* altimeter, which is much more accurate than the older "precision altimeter." Additionally, it has a small window and a geared knob which enables you to correct the barometric pressure reading in accordance with data provided by a weather observer. (You can also use this knob to correct the altimeter readout to a known local elevation.) The altimeter is one of the required instruments for all powered aircraft, but the sensitive barometer is required only for IFR operations.

In order to function properly the pressure altimeter must be able to sense the ambient pressure at all times. This is made possible by venting or static air tubes, which culminate in one or more vents at the fuselage wall or a static pressure probe. In some aircraft an alternate static air vent is provided inside the cabin; in the event of conditions which might clog up the external vents (dust storms, icing, mud splashing) the pilot can switch manually to internal vents.

At least two other instruments—the air-

speed indicator and the vertical speed indicator—share the same static air system with the altimeter, so that erratic behavior on the part of any one of these three should make the pilot suspicious of the other two. Altimeter errors *can* result from worn or jammed gears, but the most common altimeter malfunctions arise from blockage of the static system by foreign objects, such as paint, bugs, wax, dirt, ice, or water. Following the Mooney accident described earlier, investigators found the equivalent of three tablespoons of water trapped in the lines.

Aircraft which are to be flown under instrument conditions must be inspected once every 24 months as provided for in the regulations (Part 43, Appendix E). This is a very thorough inspection of the static system and the instrument, which may only be performed by an appropriately rated repair station specialist. For VFR operations, however, the altimeter is subject only to the normal annual or other periodic inspection procedures for instruments, performed by an airframe rated mechanic, who checks only such items as overall condition, mounting, marking, and (where practicable) operability.

In this type of inspection, certain altimeter problems which may have surfaced during flight may not be apparent to the mechanic unless the pilot or owner brings them to his attention. Sometimes that is not done in order to save additional maintenance expenses, but this can be very bad economics if it leads ultimately to an accident.

The rule which makes an altimeter mandatory for all flight operations states only that it must be in "operable condition"—i.e., the pilot is allowed some leeway for deciding how large an error may be tolerated.

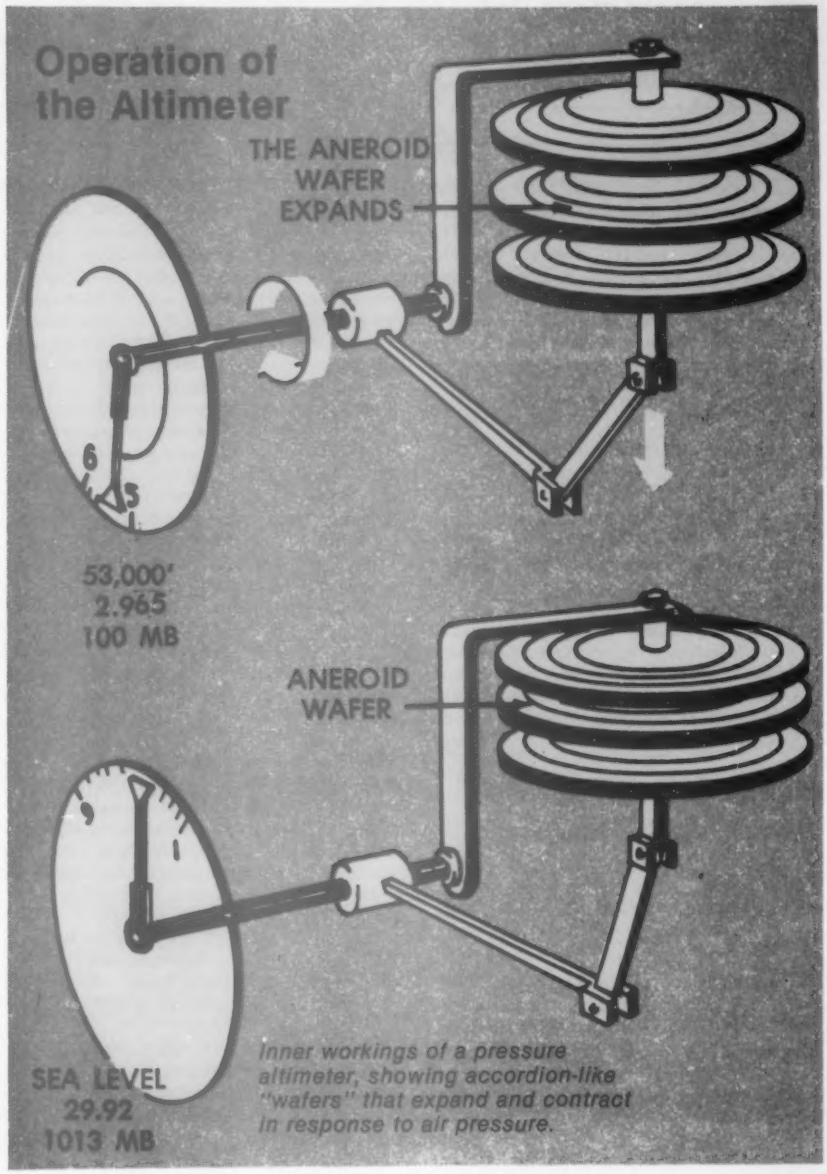
However, FAA's Instrument Flying Handbook and the latest issue of AIM advise as follows: *If the variation between the known field elevation and the altimeter indication is more than 75', plus or minus (after being adjusted to the current local pressure setting), its accuracy is questionable and should be looked into by an appropriately rated repair station.* In terms of pilot responsibility for aircraft safety, these guidelines can be considered applicable for VFR flight as well.

Preflight examination of the static air system by the pilot consists simply of checking the surface around the vent and drain holes for obvious blockage or structural damage. No one other than a certificated mechanic should attempt to clean out the static lines, even by blowing into them—this could damage sensitive instrument parts. However, alert scanning of the instrument dial, both before and after takeoff, could identify problems that may call for an immediate landing and professional attention.

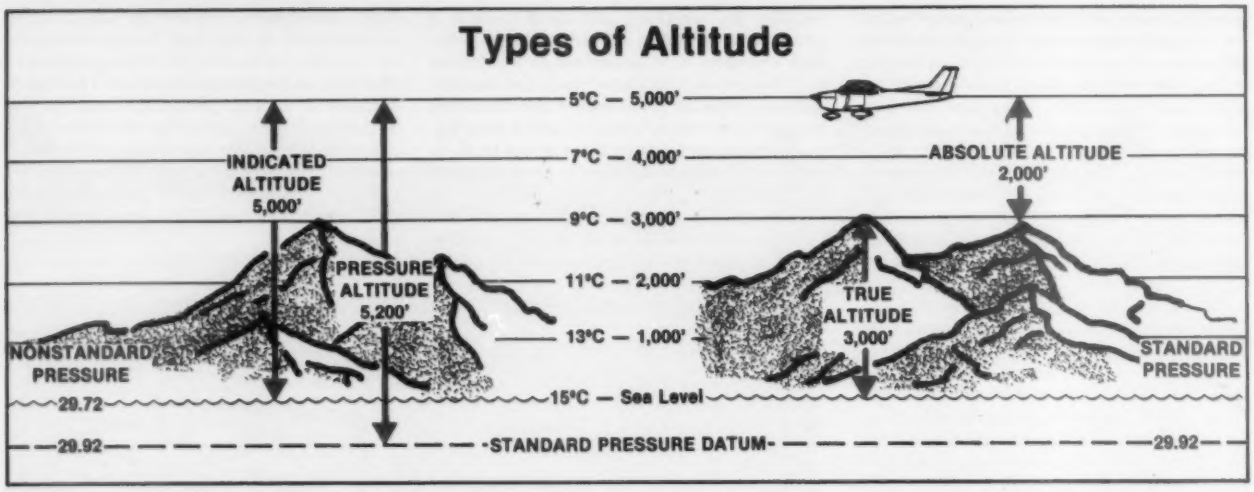
For example, if there is a considerable discrepancy between the known field elevation and the altitude shown on the instrument, (after adjustment for local pressure), simply correcting the elevation readout does not necessarily "fix" anything, and could result in a gross error in cruise, following frontal pressure changes. It is important to remember that the pressure altimeter does not measure distance directly; it measures the difference between ambient air pressure and a base figure such as air pressure at mean sea level, or elsewhere, in accordance with the pilot's needs.

Atmospheric pressure is the weight of a vertical column of air beginning at any point in the airspace and extending up through the entire atmosphere. The *average* weight of the air measured at sea level is approximately 14.7 psi (lbs. per sq. in.), which is equivalent to 29.92 Hg on the barometric scale. This figure declines at a fairly predictable rate as the altitude increases, so that the altimeter can be calibrated to relate altitude to differential pressure. There are half a dozen different types of "altitudes," and it is important to understand their individual significance. For example:

INDICATED ALTITUDE is the altitude



Inner workings of a pressure altimeter, showing accordion-like "wafers" that expand and contract in response to air pressure.



above mean sea level when the altimeter's barometric scale has been corrected to a current, local official weather observation. VFR cruise altitudes and IFR assigned altitudes below 18,000' are always "indicated." Care must be taken to be precise in adjusting the pressure setting: one inch on the barometric scale roughly equals 1,000' of altitude.

TRUE ALTITUDE is the height of fixed land forms above mean sea level, as indicated on charts. This is a geometrical determination, which would not coincide with an indicated reading unless the instrument is locally adjusted and the atmospheric conditions are exactly standard.

ABSOLUTE ALTITUDE is height (of the aircraft) above the terrain—or terrain clearance. It may be determined directly by a radio altimeter, if available, or by subtracting true altitude of the terrain from indicated aircraft altitude. However, appropriate allowances must be made for atmospheric variables in the pressure instrument readout, in order to assure safe clearance.

PRESSURE ALTITUDE is based on the difference between ambient atmospheric pressure and a base barometric setting of 29.92 (standard pressure). In order to determine the pressure altitude your altimeter would have to be set to 29.92"Hg. The altitude readout would not necessarily be the distance above MSL, but the height above an imaginary plane—above, at or below MSL—wherever a barometric reading of 29.92 could be found.

DENSITY ALTITUDE is pressure altitude corrected for non-standard temperature. Density refers to the *mass* of a given volume of air, rather than its weight, and is not meaningful in terms of height above any point. Both density and pressure altitude are used to compute aircraft performance data under non-standard conditions.

GROUND ZERO ALTITUDE is the altimeter reading when the aircraft altimeter scale has been adjusted to produce a reading of zero altitude prior to takeoff. It may be used by aerobatic and ag pilots, hot air balloonists, ultralighters and gliders, as well as by pilots who routinely fly at low altitudes on pipeline surveys, fire patrol, etc. Some air carriers, which have more than one pressure altimeter in the panel, may designate one of the instruments to be set at ground zero before takeoff or landing. But ground zero altimetry is not recommended as a general practice, because of the danger of forgetting to change over to indicated altitude, or otherwise becoming confused when flying over obscured ground.

Aircraft equipped with mode C (altitude encoding) transponders transmit their altitude to air traffic facilities either from the panel altimeter or from a second or "blind" altimeter, which is not visible or accessible to the pilot. The two instruments are compared during inspection, to ensure that their differential error does not exceed a given tolerance.

All encoded information is derived directly from the pressure sensor. Erratic instruments can pass on misinformation to ATC that could result in erroneous altitude assignments.

On the other hand, the encoding altimeter affords the pilot an opportunity to verify the accuracy of his altimeter setting, simply by asking ATC what altitude reading his transponder is showing for his aircraft.

Any significant lack of agreement between indicated and reported altitudes is a cause for concern. The pilot should have his instrument and static system inspected by a qualified repair shop without delay.

Even when the static air system and the altimeter are functioning normally, significant altitude reporting errors can take place in the event of local turbulence, notably in mountain passes. On some occasions in the Appalachians, pilots have narrowly cleared peaks which, according to the altimeter should have been a good 1,000' below them. Apparently in some circumstances the venturi effect of wind in the passes will radically affect air pressure. For this reason VFR pilots are advised to maintain at least 2,000' minimum en route clearance over mountainous terrain, and greater clearance over high mountains when these are obscured by weather.

For the sake of altimeter accuracy the instrument must be corrected, when flying below 18,000', to the current setting at a station along the route within 100 nautical miles; if not available, the nearest appropriate station. If there is no operable radio on board, an appropriate setting available before takeoff may be used.

Pilots who are not equipped to make radio contact with ATC may also obtain some guidance from their outside air thermometer. A sizable drop in temperature at the same altitude invariably means a reduction in air pressure. This means that, if uncorrected, the indicated altitude will be higher than the actual distance above MSL. Similarly, if your flight path is to take you into an area of forecast lower air pressure, you should anticipate a loss of instrument altimeter accuracy. Colder temperatures and lower pressure (than standard) will place the aircraft *lower than the altimeter indication*. "Cold or low watch out below!" is the time-honored maxim. Note: Indicated altimeter readings are also subject to error when the *rate* of temperature and/or pressure change is non-standard.

Given normal maintenance and appropriate settings, plus intelligent scanning, the altimeter is one mechanical device which should rarely be the cause of an aircraft accident. Perhaps because it is such an essentially simple, foolproof instrument we sometimes forget how crucially important it can be to the safety of flight, and assume we can do without it now and then.

This is asking for trouble. ■

Revised Written Tests

The transition period during which applicants seeking certification as Airline Transport Pilot—Airplane, Flight Navigator or Aircraft Dispatcher may take the written test under either the old testing system or the new one is in its final three months. As of September 1, 1985, such applicants must take the new tests. These, in addition to the normal updating, include a number of questions related to graphic material not found in the old test guides.

The optional transition period for the written tests for the Private Pilot certificate and its associated ratings continues until September 1, 1986. All other certificate and/or rating applicants (e.g. commercial, instrument, aviation mechanic, flight instructor, etc.) have been required to use the new system as of September 1, 1984.

The basic content and format of the tests have not changed. However, the new tests and test guides (or "Questions Books," as they are now called) have different illustrations, charting and navigation examples, and weight and balance and other computation problems. Furthermore, the new tests and guides reflect the most recent rule and policy changes and will contain questions pertinent to these changes.

Another major difference between the old and new systems is that FAA has begun including in the new tests (as a response to a National Transportation Safety Board recommendation) questions pertaining to *visual scanning techniques*. These questions will be based on information contained in Advisory Circular 90-48C, "Pilot's Role in Collision Avoidance," and in the article in the July/August 1984 issue of FAA GENERAL AVIATION NEWS, "Scanning for Survival." (This information will also be contained in the current *Airman's Information Manual*.)

FAA's written test guide system was revamped in 1984. Instead of a separate study guide for each certificate and rating, the study guides and test booklets have been consolidated to include all subject matter appropriate to a particular airman certificate and its associated categories and ratings. For example, the private pilot study guide contains questions on the airplane, rotorcraft, glider, balloon, and lighter-than-air private pilot written tests. There are now a total of 11 tests guides compared to over 20 previously. These are the current consolidated written test guides:

- Private Pilot Question Book
- Commercial Pilot Question Book
- Flight Instructor Question Book
- Fundamentals of Instruction and Ground Instructor Question Book
- ATP - Airplane (Part 135) Question Book
- ATP - Airplane (Part 121) Question Book
- Instrument Rating Question Book
- Flight Engineer Question Book
- Aviation Mechanic General Question Book
- Aviation Mechanic Airframe Question Book
- Aviation Mechanic Powerplant Question Book

The consolidated test guides also provide an index to indicate where the airman or applicant may find the answers to each question in preparation for study. Also, when the airman receives the written test report, it will indicate the exact questions that were missed, to enable corrections to be made in the airman's understanding of this matter.

There have been some problems. When examiners first received their copies of the new tests, early last year, they found some discrepancies in the questions. A few were worded ambiguously; some apparently offered no correct answer among the choices; some offered more than one correct choice, etc. As these problems were ironed out, several question books had to be reviewed and partially rewritten. Hence a schedule of transition periods was established so that airmen who were eager to get on with certification could be administered one of the previous tests, instead of waiting for the new ones.

Airmen should note, however, that if they choose to take one of the old tests, the examiner may have to backorder it from FAA, which may take some time. Many examiners cleared out their supplies of the old tests, anticipating the arrival of the new material. Furthermore, airman tested under the old system will not receive the list of exact test questions missed.

For additional information and background on the new written tests and their associated question books, consult your nearest Flight Standards District Office, or see Advisory Circular 60-17A, "New Airman Written Test System," which can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Check the price with GPO before ordering. ■

VISUAL SCANNING TECHNIQUES

Information on visual scanning techniques that will soon be included in airman written and flight tests may also be obtained from an audio-visual presentation offered by FAA's Accident Prevention Program called "Take Two and See." Your local accident prevention specialist will schedule a showing at your request at a pilot safety seminar. Also see the FAA GENERAL AVIATION NEWS Reprint, "Heads Up!" which may be obtained from your APS as well.

Proposed Part 91 Revision—A Special Tear-out Section

Finding your way through the regulatory maze

The midsection of the Federal Aviation Regulations known as Part 91 is almost as familiar to and frequently consulted by serious pilots as a family Bible. Material covering flight operations was codified in a very logical and systematic form from the pre-existing Civil Aviation Regulations in 1963. The part was assigned 311 rule slots (91.1, 91.2, etc., on up to 91.311) with alternate numbers left blank for later insertions. Like material was grouped into five subparts, covering (A) general information, (B) flight rules, (C) maintenance, (D) large and turbine-powered airplanes, and (E) operating noise limits. After less than 25 years of existence in its present form it is about to be revised: why?

Because many pilots have complained recently that looking up the appropriate rule can be excessively time-consuming, as some rules with related information are no longer adjacently located; some are extremely complicated, and some require the services of an aviation lawyer to interpret.

To some extent this is true, perhaps inevitably so. With the very rapid expansion of aviation in the 60's and 70's, rulemaking quickly filled in vacant number slots. Soon it became necessary to locate new rules at a considerable distance from related material—sometimes even in a different subpart. Consequently, it could be necessary to inspect almost the entire Part 91 in order to be sure of identifying all of the regulatory matter concerning one specific subject. In some cases, alternately, what would have been a new rule normally was tacked on to an existing rule to which it was more or less related. The result of this procedure was often confusing as to the intent of the rule, as well as to its meaning. Rules were "stretched" to a maximum, divided into paragraphs, sections, subsections, etc., in order to avoid locating new rules remotely.

Solving this problem of overcrowding is not an easy matter, given the obligatory standard form of rule codification in the Federal Government. Once enacted, rules cannot be readily abolished or altered numerically because many rules refer to other rules by number. To realign and simplify Part 91 it has been necessary to carry out a complete overhaul, which has taken place over the past two years, after numerous consultations with the general flying public and the aviation industry. The proposed form of this revision was published in the *Federal Register* dated March 20, 1985.

The proposed revised format is very similar to the original, except that there are now 10 subparts instead of five, and 134 rules contained within 899 number slots. All of the even numbers are initially left blank, and there are also generous blocks of unused (reserved) rule numbers at the end of each subpart. This should provide ample room for rule development until well into the next century.

The proposed reorganization is a boon to general aviation airmen, since the new subparts A through E would pertain mostly to VFR pilots flying small reciprocating engine airplanes. Material found in subparts F through J would apply primarily to operators of larger aircraft. If enacted, the new Part 91 would outline like this:

- Subpart A—General §91.1–§91.25
- Subpart B—Flight Rules §91.101–§91.193
- Subpart C—Equipment, Instrument, and Certificate Requirements §91.201–§91.219
- Subpart D—Special Flight Operations §91.301–§91.323
- Subpart E—Maintenance, Preventive Maintenance, and Alterations §91.401–§91.421
- Subpart F—Recoverable Expenses for Certain Operators §91.501
- Subpart G—Additional Equipment and Operating Requirements for Large and Transport Category Aircraft §91.601–§91.645
- Subpart H—Foreign Aircraft Operations and Operations of U.S. Registered Civil Aircraft to Areas Outside of the U.S. §91.701–§91.715
- Subpart I—Operating Noise Limits §91.801–§91.821
- Subpart J—Waivers §91.901–§91.905

Current Appendices A, B, and C would remain the same. Note that each subpart is set out in hundreds; i.e., all flight rules would be found in the 91.200's, all maintenance rules in the 91.400's and so on. The final significant difference in the proposal is the use of "he or she" and "him or her" when referring to airmen.

In addition to the realignment, FAA took the opportunity to propose a few changes in some of the rules. Most of these alterations would fall under the category of minor editorial revisions, designed to clarify a term or promote consistency. For example, proposed §91.107(b) (current §91.14—Use of safety belts) inserts the word "approved" before any mention of "seat or berth" to make it unmistakably clear that *un*approved seats or berths—such as suitcases or cargo boxes—may not be used by occupants.

One change for the sake of consistency concerns the use of "statute miles" in sections of Part 91 that refer to instrument flight: these references have been changed to "nautical miles" for commonality with instrument charts.

There are also a few significant proposed changes that bear particular notice because of the benefits offered airmen and operators. Proposed §91.117, Aircraft Speed (current §91.70), would increase the maximum speed allowed in an airport traffic area for a reciprocating engine aircraft from 156 knots to 200 knots. This would allow easier mixing of multiengine reciprocating aircraft with the increasing numbers of small, turbine-power business aircraft.

Current §91.97, Positive Control Areas and Route Segments, re-

quires that operators who desire for whatever reasons to deviate from the equipment or other requirements of this section submit such a request in writing at least four days in advance of the operation. Recognizing that current telecommunications and air traffic control equipment are more flexible, the proposed §91.35 would require a 48-hour oral notification.

Proposed §91.409 (replacing current §91.169, Inspections) would allow operators of turbine-powered rotorcraft to use alternate inspection programs—other than the annual or the 100-hour—provided the program is FAA-approved.

A final proposed change of note is that instead of separate references to General Aviation District Offices, Air Carriers District Offices, and Flight Standards District Offices, all FAA field offices would be called (in the rule) Flight Standards district offices. Each of the three offices can perform all of their separate functions, so the FAA felt a little streamlining of language would aid in the simplification of Part 91.

Following is a table, which, when used with a copy of the current Part 91 and the proposed Part 91, will help you understand the proposed reorganization as it now stands. Some changes are likely to be made before final enactment of the rule, as a result of comments, but the table can be updated by hand for subsequent guidance. For example:

Material in Old Section	Moves to new Section	Old Section Number becomes
§91.11 Liquor and Drugs	§91.17	§91.11 Prohibition Against Interference with crewmembers

You may obtain a free copy of NPRM No. 79–2C from FAA's Office of Public Affairs, APA-430, 800 Independence Ave., S.W., Washington, D.C. 20591. Comments (in duplicate) must be received by FAA's Office of the Chief Counsel (AGC-204, Docket No. 18334, same street address) by July 19, 1985 in order to be considered in the preparation of the final rule. ■

A COMPARISON OF CURRENT PART 91 AND THE PROPOSED CHANGES

MATERIAL IN OLD SECTION . . .	MOVES TO NEW SECTION . . .	OLD SECTION NUMBER NOW COVERS . . .
SUBPART A (General)		SUBPART A (General)
§91.1 Applicability	§91.1 and §91.703	§91.1 Applicability
§91.2 Certificate of authorization for Category II operations	§91.193	Not in use
§91.3 Responsibility & authority of the pilot-in-command	Unchanged	Unchanged
§91.4 Pilot-in-command of aircraft requiring more than one pilot	§91.5	Not in use
§91.5 Preflight Action	§91.103	§91.5 Pilot-in-command of aircraft requiring more than one pilot
§91.6 Category II and III operations: General operating rules	§91.189	Not in use
§91.7 Flight crewmembers at stations	§91.105	§91.7 Civil aircraft airworthiness
§91.8 Prohibition against interference with crewmembers	§91.11	Not in use
§91.9 Careless or reckless operation	§91.13	§91.9 Civil aircraft operating limitations and marking requirements
§91.10 Careless or reckless operation other than for the purpose of air navigation	§91.13	Not in use
§91.11 Liquor and drugs	§91.17	§91.11 Prohibition against interference with crewmembers
§91.12 Carriage of narcotic drugs, marihuana, and depressant or stimulant drugs or substances	§91.19	Not in use
§91.13 Dropping objects	§91.15	§91.13 Careless or reckless operation
§91.14 Use of safety belts	§91.107	Not in use
§91.15 Parachutes and parachuting	§91.307	§91.15 Dropping objects
§91.17 Towing: Gliders	§91.309	§91.17 Liquor and drugs
§91.18 Towing: Other . . .	§91.311	Not in use
§91.19 Portable electronic devices	§91.21	§91.19 Carriage of narcotic drugs, marihuana, depressant or stimulant drugs or substances
§91.20 Operations within the North Atlantic Minimum Navigation Performance Specifications Airspace	§91.705	Not in use
§91.21 Flight Instruction: Simulated instrument flight and certain flight tests	§91.109	§91.21 Portable electronic devices
§91.22 Fuel requirements for flight under VFR	§91.151	Not in use
§91.23 Fuel requirements for flight in IFR conditions	§91.167	§91.23 Truth in leasing clause requirement in leases and conditional sales contracts
§91.24 ATC transponder and altitude reporting equipment use	§91.215	Not in use
§91.25 VOR equipment check for IFR operations	§91.171	§91.25 Aviation Safety Reporting Program: Prohibition against use of reports for enforcement purposes
§91.27 Civil aircraft: Certifications required	§91.203	§91.27–91.99 Reserved
§91.28 Special flight authorizations for foreign civil aircraft	§91.715	
§91.29 Civil aircraft airworthiness	§91.7	
§91.30 Inoperable instruments and equipment for multiengine aircraft	§91.213	
§91.31 Civil aircraft operating limitations and marking requirements	§91.9	
§91.32 Supplemental Oxygen	§91.211	
§91.33 Powered civil aircraft with standard category U.S. airworthiness certificates: Instrument and equipment requirements	§91.205	

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MATERIAL IN OLD SECTION . . .	MOVES TO NEW SECTION . . .	OLD SECTION NUMBER NOW COVERS . . .
§91.34 Category II manual	§91.191	Reserved
§91.35 Flight recorders and cockpit voice recorders	§91.609	
§91.36 Data correspondence between automatically reported pressure altitude data and the pilot's altitude reference	§91.217	
§91.37 Transport category civil airplane weight limitations	§91.605	
§91.38 Increased maximum certificated weights for certain airplanes operating in Alaska	§91.323	
§91.39 Restricted category civil aircraft; operating limitations	§91.313	
§91.40 Limited category civil aircraft; operating limitations	§91.315	
§91.41 Provisionally certificated civil aircraft; operating limitations	§91.317	
§91.42 Aircraft having experimental certificates; operating limitations	§91.319	
§91.43 Special rules for foreign civil aircraft	§91.711	
§91.45 Authorization for ferry flights with one engine inoperative	§91.611	
§91.47 Emergency exits for airplanes carrying passengers for hire	§91.607	
§91.49 Aural speed warning device	§91.603	
§91.50 reserved	Deleted	
§91.51 Altitude alerting system or device; turbojet powered civil airplanes	§91.219	
§91.52 Emergency locator transmitters	§91.207	
§91.53 Reserved	Deleted	
§91.54 Truth in leasing clause requirement in leases and conditional sales contracts	§91.23	
§91.55 Civil aircraft sonic boom	§91.817	
§91.56 Agricultural and firefighting airplanes; noise operating limitations	§91.815	
§91.57 Aviation Safety Reporting Program: Prohibition against using reports for enforcement purposes	§91.25	
§91.58 Material for compartment interiors	§91.613	
§91.59 Carriage of candidates in Federal elections	§91.321	
SUBPART B (Flight Rules)		
§91.61 Applicability	§91.101	
§91.63 Waivers	§91.903	

MATERIAL IN OLD SECTION . . .	MOVES TO NEW SECTION . . .	OLD SECTION NUMBER NOW COVERS . . .
§91.65 Operating near other aircraft	§91.111	Reserved
§91.67 Right of way rules; except water operations	§91.113	
§91.69 Right of way rules; water operations	§91.115	
§91.70 Aircraft speed	§91.117	
§91.71 Acrobatic flight	§91.303	
§91.73 Aircraft lights	§91.209	
§91.75 Compliance with ATC clearances and instructions	§91.123	
§91.77 ATC light signals	§91.125	
§91.79 Minimum safe altitudes	§91.119	
§91.81 Altimeter settings	§91.121	
§91.83 Flight plan; information required	§91.153 and 91.169	
§91.84 Flights between Mexico or Canada and the U.S.	§91.707	
§91.85 Operating on or in the vicinity of an airport	§91.127	
§91.87 Operation at airports with an operating control tower	§91.129	
§91.89 Operation at airports without control towers	§91.127	
§91.90 Terminal Control areas	§91.131	
§91.91 Temporary flight restrictions	§91.137	
§91.93 Flight test areas	§91.305	
§91.95 Restricted and prohibited areas	§91.133	
§91.97 Positive control areas and route segments	§91.135	
§91.100 Emegency air traffic rules	§91.139	
§91.101 Operations to Cuba	§91.709	SUBPART B (Flight Rules)
		§91.101 Applicability
§91.102 Flight limitation in the proximity of space flight recovery operations	§91.143	Not in use
§91.103 Operation of civil aircraft of Cuban registry	§91.713	§91.103 Preflight action
§91.104 Flight restrictions in the proximity of the Presidential and other parties	§91.141	Not in use
Visual Flight Rules		
§91.105 Basic VFR weather minimums	§91.155	§91.105 Flight crewmembers at stations
§91.107 Special VFR weather minimums	§91.157	§91.107 Use of safety belts
§91.109 VFR cruising altitude or flight level	§91.159	§91.109 Flight instruction; simulated instrument flight and certain flight tests
§91.111 none		§91.111 Operating near other aircraft
§91.113 none		§91.113 Right of way rules; except water operations

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MATERIAL IN OLD SECTION . . .	MOVES TO NEW SECTION . . .	OLD SECTION NUMBER NOW COVERS . . .
Instrument Flight Rules		
§91.115 ATC clearance and flight plan required	§91.173	§91.115 Right of way rules; water operations
§91.116 Takeoff and landing under IFR	§91.175	Not in use
§91.117 Reserved		§91.117 Aircraft speed
§91.119 Minimum altitudes for IFR operations	§91.177	§91.119 Minimum safe altitudes; general
§91.121 IFR cruising altitude or flight level	§91.179	§91.121 Altimeter settings
§91.123 Course to be flown	§91.181	§91.123 Compliance with ATC clearance and instructions
§91.125 IFR radio communications	§91.183	§91.125 ATC light signals
§91.127 IFR operations; two way radio communications failure	§91.185	§91.127 Operating on or in the vicinity of an airport; general rules
§91.129 Operation under IFR in controlled airspace; malfunction reports	§91.187	§91.129 Operations at airports with operating control towers
§91.131–91.159		§91.131 Terminal Control Areas
		§91.133 Restricted and prohibited areas
		§91.135 Positive control areas and route segments
		§91.137 Temporary flight restrictions
		§91.139 Emergency air traffic rules
N O N E X I S T E N T		§91.141 Flight restrictions in the proximity of the Presidential and other parties
		§91.143 Flight limitations in the proximity of space flight recovery operations
		§91.145–91.149 Reserved
		Visual Flight Rules
		§91.151 Fuel requirements for flight under VFR
		§91.153 VFR flight plan; information required
		§91.155 Basic VFR weather minimums
		§91.157 Special VFR weather minimums
		§91.159 VFR cruising altitude or flight level
SUBPART C (Maintenance, Preventive Maintenance, and Alterations		
§91.161 Applicability	§91.401	§91.161 Reserved
§91.163 General	§91.403	§91.163 Reserved
§91.165 Maintenance required	§91.405	§91.165 Reserved
§91.167 Operation after maintenance, preventive maintenance, or alterations	§91.407	Instrument Flight Rules §91.167 Fuel requirements for flight in IFR conditions
§91.169 Inspections	§91.409	§91.169 IFR flight plans; information required
§91.170 Changes to aircraft inspection programs	§91.415	Not in use
§91.171 Altimeter system and altitude reporting equipment tests and inspection	§91.411	§91.171 VOR equipment check for IFR operations
§91.172 ATC transponder tests and inspections	§91.413	Not in use
§91.173 Maintenance records	§91.417	§91.173 ATC clearance and flight plan required
§91.174 Transfer of maintenance records	§91.419	Not in use
§91.175 Rebuilt engine maintenance records	§91.421	§91.175 Takeoff and landing under IFR
§91.177–91.179 Nonexistent		§91.177 Minimum altitudes for IFR operations
		§91.179 IFR cruising altitude or flight level
SUBPART D (Large and Turbine-powered Multiengine Airplanes)		
§91.181 Applicability	§91.501	§91.181 Course to be flown
§91.183 Flying equipment and operating information	§91.615	§91.183 IFR radio communications
§91.185 Familiarity with operating limitations and emergency equipment	§91.617	§91.185 IFR operations; two way radio communications failure
§91.187 Equipment requirements; over the top or night VFR operations	§91.619	§91.187 Operation under IFR in controlled airspace; malfunction reports
§91.189 Survival equipment for overwater operations	§91.621	§91.189 Category II and III operations; general operating rules
§91.191 Radio equipment for overwater operations	§91.623	§91.191 Category II manual
§91.193 Emergency equipment	§91.625	§91.193 Certificate of authorization for certain Category II operations
§91.195 Flight altitude rules	§91.627	§91.195–91.199 Reserved
§91.197 Smoking and safety belt signs	§91.629	
§91.199 Passenger briefing	§91.631	
§91.200 Shoulder harness	§91.633	
§91.201 Carry-on baggage	§91.635	SUBPART C (Equipment, Instrument, and Certificate Requirements) §91.201 Applicability
§91.203 Carriage of cargo	§91.637	§91.203 Civil aircraft; certifications required
§91.205 Transport category airplane weight limitations	Deleted	§91.205 Powered civil aircraft with standard category U.S. airworthiness certificates; instrument and equipment requirements
§91.207 None		§91.207 Emergency locator transmitters
§91.209 Operating in icing conditions	§91.639	§91.209 Aircraft lights
§91.211 Flight engineer requirements	§91.641	§91.211 Supplemental oxygen
§91.213 Second-in-command requirements	§91.643	§91.213 Inoperable instruments and equipment for multiengine aircraft

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MATERIAL IN OLD SECTION . . .	MOVES TO NEW SECTION . . .	OLD SECTION NUMBER NOW COVERS . . .
§91.215 Flight attendant requirements	§91.645	§91.215 ATC transponder and altitude reporting equipment use
§91.217–91.299 None **Nonexistent**		§91.217 Data correspondence between automatically reported pressure altitude data and the pilot's altitude reference
		§91.219 Altitude alerting system or device; turbo jet-powered civil airplanes
		§91.221–91.299 Reserved
SUBPART E (Operating Noise Limits)		**SUBPART D** (Special Flight Operations)
§91.301 Applicability; relation to Part 36	§91.801	§91.301 Applicability
§91.302 Part 125 operators; designation of applicable regulations	§91.803	Not in use
§91.303 Final compliance; subsonic airplanes	§91.805	§91.303 Aerobatic flight
§91.305 Phased compliance under Parts 121 and 135; subsonic airplanes	§91.807	§91.305 Flight test areas
§91.306 Replacement airplanes	§91.809	Not in use
§91.307 Service to small communities exemption; two-engine, subsonic airplanes	§91.811	§91.307 Parachutes and parachuting
§91.308 Compliance plans and status; U.S. operators of subsonic airplanes	§91.813	Not in use
§91.309 Civil supersonic airplanes that do not comply with Part 36	§91.819	§91.309 Towing: Gliders
§91.311 Civil supersonic airplanes: Noise limits	§91.821	§91.311 Towing: Other than §91.309

§91.311 **ENDS CURRENT FAR PART 91**

SECTION NUMBERS NOT FOUND IN EXISTING PART 91

NEW SECTION NUMBERS . . .

§91.313 Restricted category civil aircraft; operating limitations

§91.315 Limited category civil aircraft; operating limitations

§91.317 Provisionally certified civil aircraft operating limitations

§91.319 Aircraft having experimental certificates

§91.321 Carriage of candidates in Federal elections

§91.323 Increased maximum certificated weights for certain airplanes operated in Alaska

§91.325–91.399 Reserved

SUBPART E—Maintenance, Preventive Maintenance, and Alterations

§91.401 Applicabiity

§91.403 General

§91.405 Maintenance required

§91.407 Operatons after maintenance

§91.409 Inspections

§91.411 Altimeter system and altitude reporting equipment tests and inspections

§91.413 ATC transponder tests and inspections

§91.415 Changes to aircraft inspection programs

§91.417 Maintenance records

§91.419 Transfer of maintenance records

§91.421 Rebuilt engine maintenance records

§91.423–91.499 Reserved

SUBPART F—Recoverable expenses for certain operations

§91.501 Applicability

§91.503–91.599 Reserved

SUBPART G—Additional Equipment and Operating Requirements for Large and Transport Category Aircraft

§91.601 Applicability

§91.603 Aural speed warning device

§91.605 Transport category civil airplane weight limitations

§91.607 Emergency exits for airplanes carrying passengers for hire

§91.609 Flight recorders and cockpit voice recorders

§91.611 Authorization for ferry flight with one engine inoperative

§91.613 Materials for compartment interiors

§91.615 Flying equipment and operating information

§91.617 Familiarity with operating limitations and emergency equipment

§91.619 Equipment requirements; over the top or night VFR operations

§91.621 Survival equipment for overwater operations

§91.623 Radio equipment for overwater operations

§91.625 Emergency equipment

§91.627 Flight altitude rules

§91.629 Smoking and safety belts

§91.631 Passenger briefing

§91.633 Shoulder harness

§91.635 Carry-on baggage

§91.637 Carriage of cargo

§91.639 Operating in icing conditions

§91.641 Flight engineer requirements

§91.643 Second-in-command requirements

§91.645 Flight attendant requirements

§91.647–91.699 Reserved

SUBPART H—Foreign Aircraft Operations and Operations of U.S. Registered Civil Aircraft to Areas Outside of the United States

§91.701 Applicability

§91.703 Operations of civil aircraft of U.S. registry outside of the U.S.

§91.705 Operations within North Atlantic MNPS airspace

§91.707 Flights between Mexico or Canada and the U.S.

§91.709 Operations to Cuba

§91.711 Special rules for foreign civil aircraft

§91.713 Operation of civil aircraft of Cuban registry

§91.715 Special flight authorization for foreign civil aircraft

§91.717–91.799 Reserved

SUBPART I—Operating Noise Limits

§91.801 Applicability: Relation to Part 36

§91.803 Part 125 operators; designation of applicable regulations

§91.805 Final compliance; subsonic airplanes

§91.807 Phased compliance under Parts 121, 125, and 135; subsonic airplanes

§91.809 Replacement airplanes

§91.811 Service to small communities; two-engine subsonic airplanes

§91.813 Compliance plans and status; U.S. operations of subsonic airplanes

§91.815 Agricultural and firefighting airplanes

§91.817 Civil aircraft sonic boom

§91.819 Civil supersonic airplanes that do not comply with Part 36

§91.821 Civil supersonic airplanes; noise limits

§91.823–91.899 Reserved

SUBPART J—Waivers

§91.901 Applicability

§91.903 Policy and procedures

§91.905 List of rules subject to waiver

§91.907–91.999 Reserved

END OF PROPOSED PART 91 ■

The Longest Solo Balloon Flight

Joe Kittinger: The Adventure Continues

"Life is an adventure, and I am an adventurer."

This sounds like an understatement coming from a man who has parachuted out of a balloon from the edge of space, has exceeded the speed of sound without benefit of an aircraft or spaceship, has been a test pilot for radically new military aircraft, and has seen three tours of combat flight duty in Vietnam (see March/April 1985 issue of *FAA General Aviation News*). But at 56 years of age, with 14 military medals and 29 civilian decorations, Joseph Kittinger is still searching for excitement.

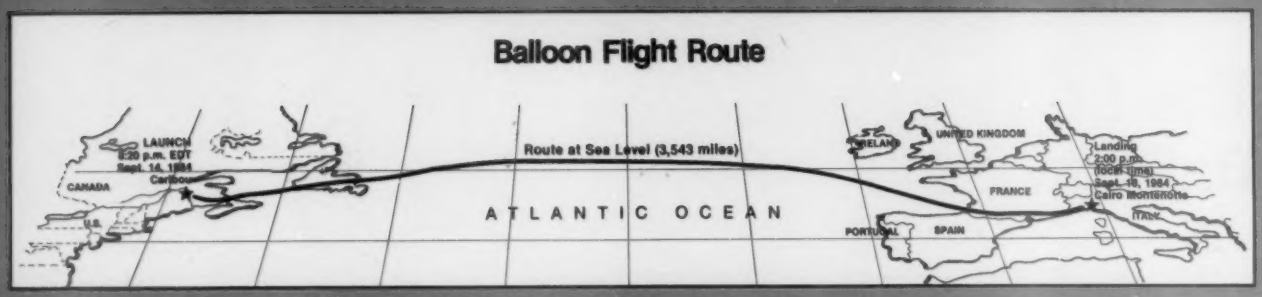
His latest quest was born during his 11 months as a wounded prisoner in Vietnam, after bailing out of his crippled F-4. To resist relentless "brainwashing" Joe developed his own "mental retreat"—a fantasyland of exciting balloon voyages.

The idea of making a solo trans-Atlantic balloon crossing had been in the back of Kittinger's mind ever since his record-setting 20 mile dive from a balloon in 1960, but he never had time to pursue the idea. Captivity gave him a period of enforced inaction, which he used to get his plans together. By the time he was released in March 1973, he knew he could cross the "pond" in a balloon. It was just a matter of when—plus the wherewithal.

Five years later when Kittinger retired from the Air Force as a colonel, he saw a portion of his fantasied triumph elude him as Abruzzo, Anderson, and Newman flew the *Double Eagle II* balloon across the Atlantic. But it was not a *solo* flight: that record was still possible. Kittinger returned to his native Orlando, FL, and started pursuing his dream.

At Orlando Joe became manager of the Rosie O'Grady Flying Circus, purveyors of stunt flying, skywriting and banner towing to the celebrated Church Street Station entertainment complex. With this and other corporations as sponsors, Joe began gathering information and equipment

Balloon photo by Joseph Stancampiano ©1985 National Geographic Society



for his epic flight, while taking part in competitive balloon racing.

It was early September of 1984 before Kittinger was ready to make his attempt. Ed Yost, the famous balloon designer and almost successful trans-Atlantic aeronaut, completed for him the 101,480 cu. ft. (10 story) *Rosie O'Grady Balloon of Peace*. It carried an open 18′ × 6′ fiberglass gondola designed to hold one person with minimum essentials, including charts of wind and weather patterns, navigation instruments, radios, and food. The gondola shape was that of a small boat, for possible ditching at sea.

"Rosie" was transported to Caribou, ME to await the launch. It was followed by the back up crew, including veteran meteorologist Bob Rice, who had plotted the course of the *Double Eagle II*. In northern Maine the long, tedious wait for the "jackpot" combination of favorable winds, air pressure, and temperature began.

Everything finally came together on Friday the 14th of September, when a fast moving barometric high moved in with westerly winds reported in excess of 50 knots at 10,000′. If these conditions continued, weather specialist Rice estimated "Rosie" could reach Europe within three or four days—assuming it did not fall victim to any of the mishaps that had turned earlier Atlantic balloon flights into tragedies.

The veteran Kittinger left nothing to chance, checking on hundreds of details himself and making the final decision to launch. After his ground crew took the traditional sip of champagne he took off, once again seeking adventure. His support group grabbed a jet for Europe.

Ten hours into the flight Joe leveled out at 10,000′, picking up a 57 knot westerly that pushed him straight towards France. After a quiet day of smooth flight in cloudless, near-zero (F.) weather, excitement erupted in the form of flames from his gas cooking stove, as he prepared his Saturday supper. Half of the gondola appeared ablaze before his fire extinguisher squelched the fiery outburst. Two miles up and almost 1,000 miles out to sea, he was "a long way from a fire station."

To fortify himself against boredom and fatigue, Joe had brought along tape recordings of his favorite country and western entertainers. However, he found little time to relax or even sleep, as his multiple duties made a continuous demand on his attention. He was not only the pilot but also the radio operator, weather observer, navigator, camera man, maintenance crew, chronicler, chief cook and bottle washer, etc. There was no time to rest, except for an occasional 10 or 15 minute catnap.

Despite all the technical support—the almost continuous stream of weather data radioed from Rice's office in Bedford, MA, the battery of navigational instruments on board with satellite tracking computers, receivers and transmitters, and the short wave, marine band, HF and VHF and Omega receivers—Joe knew that his survival depended largely on his ability to remain alert and active. Since his balloon moved with the wind he had no means of determining his course and his speed over the surface except by monitoring his Omega and constantly updating his position on his charts. Maintaining speed and course were essential, if he were to avoid becoming marooned over mid-ocean or running out of energy before sighting the coast of Europe. He inhaled oxygen frequently to keep his one-man crew performance from debilitating.

By Sunday noon he was more than halfway across the Atlantic, still at 10,000′, with the vast expanse of the ocean extending from horizon to horizon. Except for intermittent chatter from the radios he was surrounded by an enormous silence. Abruptly that silence was broken by the booming noise of a loud impact—a sonic boom, in fact, from an overflying supersonic jet, that sounded in Kittinger's words, ". . .like 100,000 lbs. of dynamite going off." He became accustomed to these noisy but harmless intrusions on his solitude.

By 4:30 E.S.T. on Monday evening, less than three days after takeoff, he was over the Bay of Biscay, on the coast of southern France, and had made contact with French air traffic control. The exhausting ordeal was over. The beaches of Biarritz were in sight: he had only to land and claim his new records. Not for Joe. "Press on" was the only thought in his mind, as he began to have visions of floating over the Alps and maybe even the Kremlin.

But by this time the favoring westerly wind had diminished to a virtual doldrum, as the balloon was caught in a low pressure trough over Biarritz. After the lone voyager made slow overnight progress along the southern French border, the westerly picked up again, pushing the *Rosie O'Grady* toward the Pyrenees Mountains and the Maritime Alps (ranging up to 12,000′).

By dumping overboard all ballast and every disposable object, even extra clothes, Kittinger was able to climb to an altitude of 17,200′, high enough to cross the Alps. However, on Tuesday morning as he approached the French/Italian border he became aware of thunderstorms developing ahead. With all ballast gone he had no means of climbing over the clouds. There was only one safe way to go—down.

Joe had been aloft for 80 hours with less than two hours of accumulated sleep, but fatigue was forgotten now as he faced the challenge of landing in stormy conditions on the thickly forested mountainous terrain along the northwestern coast of Italy. He began valving out helium.

Shortly after 2:00 p.m. four helicopters, alerted by radio to Kittinger's intensions, brought a large party of news reporters, police, and life support personnel to the small village of Cairo Montenotte. As he neared the ground Joe steered "Rosie" toward a cleared area, but strong gusting winds flung the balloon against a wooded hillside. Joe was thrown out of the gondola and broke a bone in his foot, but the only thing that mattered to this intrepid aeronaut was that he had broken all records for solo ballooning: 3,565 miles nonstop.

He was still in jubilant spirits when the support team and the throng of reporters reached him a few minutes later. He was carried out of the woods on the shoulders of local woodcutters like—in his words—". . .a Roman Emperor" to a nearby helicopter, which flew him to a hospital in Nice for treatment.

After a week of recovering, attending massive receptions in Rome and Paris, and receiving French and Italian medals of honor, Joe flew back to Orlando for a ticker tape parade and a hometown hero's welcome. Later there was a visit to Washington, D.C., a reunion meeting with a Presidential admirer, and more honors and felicitations. To the ever present question, "What next, Joe?" he had a ready answer: *Why not the Pacific? Maybe Tokyo to Maryland, solo in a balloon.*

It sounds like Joe will never run out of adventures. ■

TERMINAL RADAR GUIDANCE:

A New Concept

Many of the nation's busiest airports are being identified by FAA as candidates for a new airspace configuration designed to replace Terminal Radar Service Areas. The new concept is intended to improve safety and relieve traffic problems arising from the presence of aircraft not in contact with ATC.

Such problems have been obliterated from the "Top 20" busiest U.S. airports, where the Terminal Control Area concept exerts positive control over all traffic. At the next busiest level of airport activity (about 140 such airports have been identified) a *voluntary* system of providing VFR pilots with ATC radar advisory services has been in effect for the past 15 years. Traffic advisories were initially offered, and later sequencing and continuous traffic separation, within a given airspace configuration known as a Terminal Radar Service Area (TRSA).

VFR pilot response to the TRSA concept has been good overall, with many positive benefits. However, the basic problem remained: the presence of some non-participant radar blips signifying targets whose altitude, aircraft type, flight intentions, etc., are unknown to the controllers. These unknowns interrupt the smooth, efficient flow of traffic and sometimes pose potential conflict hazards. Air carriers and other IFR users have argued that all TRSA's should be converted to TCA's

On the other hand, some pilots have criticized the non-standard shape of TRSA airspace with its variety of tiers and cutouts; the varying range of VFR services offered at the TRSA's; the apparent priority given to some non-participating aircraft; and the perceived "over-control" resulting in detours or delays during peak hours.

After considerable discussion with representative segments of aviation, including general aviation pilot associations, airport authorities, and air traffic organizations, FAA has proposd phasing out TRSA's and replacing them with a new concept—the **Airport Radar Service Area** (ARSA), which is far less restrictive than the TCA but calls for mandatory participation. A year-long confirmation of the ARSA prototype at field locations in Texas and Ohio reported very positive results.

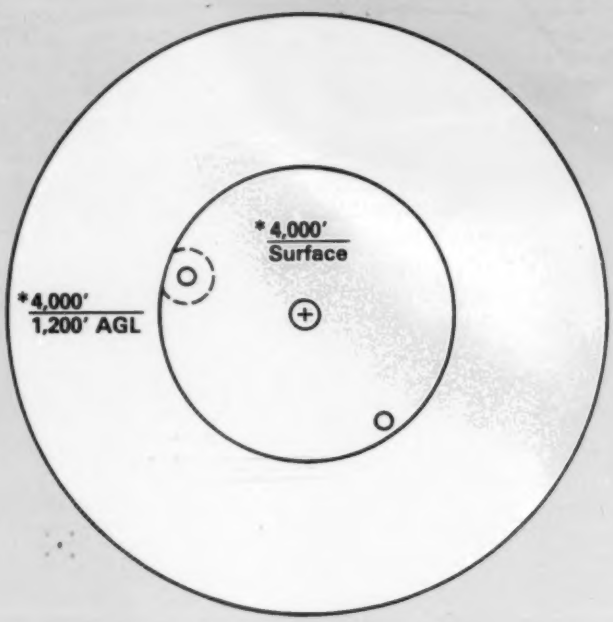
Like the familiar Airport Traffic Area the new ARSA is cylindrical in form, beginning at the surface with a five nautical mile radius. At 1,200′ AGL, however, the cylinder expands to a radius of 10 miles and continues upward to a height of 4,000′ above the primary airport elevation, giving it roughly a mushroom shape. Cutouts or irregularities from this basic design, to accommodate secondary airports, other regulatory airspace, topography, etc., will be allowed on an individual review basis. Controllers will be required to start providing ARSA services, on pilot request, for all aircraft as soon as they enter the airspace surrounding the ARSA—i.e., the airspace approximately 20 nautical miles laterally distant from the tower, extending from the lower limit of radar receptivity to the upper limit of approach control airspace.

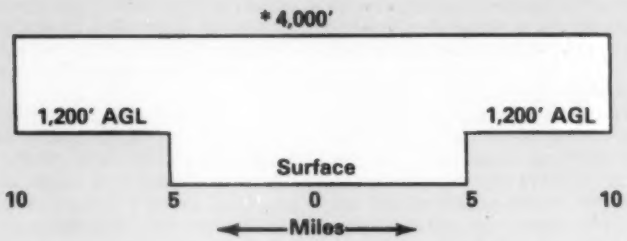
An ARSA will enclose a primary, tower controlled airport and may include one or more satellite airports. Flight operations within the area are subject to the following requirements:

a) **Arrivals and Overflights.** Two-way radio communication must be established prior to entering the area and maintained while within the area. Initial radio contact is with Approach Control, at a recommended distance of 20 miles out from the primary airport.

b) **Departures.** Two-way radio communications must be established by the usual airport routine for the primary airport and then

Airport Radar Service Area





Not to scale

BASIC ARSA SERVICES

ALL AIRCRAFT	VFR AIRCRAFT	IFR AIRCRAFT
• Mandatory Participation • Two-Way radio contact • Sequencing • Safety Advisories • Traffic Advisories	• Desired heading maintained, except for conflict resolution with IFR traffic	• Standard IFR separation • Conflict resolution, if needed

maintained with ATC while within the area. For aircraft departing from an ARSA satellite airport, two-way radio communication must be established with Departure Control as soon as practicable and maintained while within the area.

When flying in an ARSA, VFR pilots should expect to receive *sequencing* for landing; *safety advisories* where appropriate (significant weather information, airport conditions, bird hazards, etc.), *traffic advisories;* and *conflict resolution* when there is an apparent convergence with an IFR aircraft.

Note that there is a considerable difference between traffic advisories and conflict resolution. The former merely call attention to aircraft whose flight path may become a problem; maintaining a safe separation remains the pilots' responsibility. *Conflict resolution* involves vectors issued to either a VFR aircraft *or* an IFR aircraft (or both), at the same altitude, and requires changes of course and altitude.

The first regulatory ARSA's were established in mid-March of this year at Austin, TX; Columbus, OH; and Baltimore, MD. Current sectional charts depict the configuration with a thick, dashed, light blue line with altitude figures. According to Michael Sarli, tower manager at Baltimore/Washington International Airport, the first six weeks of operation have been quite encouraging. Controllers and pilots alike have commented favorably on the advantages of knowing where all the traffic is at all times, and the absence of detours.

Traffic under positive control in the Baltimore ARSA has increased 30 to 35% since the change was made, but controller workload has actually *decreased* because VFR vectoring is seldom needed. For IFR pilots the "stretching" of ATA's into ARSA's (and the dismantling of TRSA's) will have little noticeable effect on their operation, except for lessening their concern about uncontrolled aircraft with unknown intentions. ■

TO BALTIMORE, VIA TRSA AND ARSA

(Excerpts from the log of a low-time pilot who recently sampled the air space in the new ARSA at Baltimore.)

I departed Manassas, VA in a Cessna 172 and proceeded VFR to Baltimore, transitting the Dulles TRSA en route. Within the TRSA I was given the usual separation vectors, which included being moved off my planned course several times for other traffic. Eventually I was vectored back to my original course. Frequently I heard controllers warning, *"Traffic, altitude unknown."*

Twenty miles out from Baltimore, I called Approach Control on the frequency shown on my sectional. I was given traffic advisories (altitude and heading) but allowed to continue on course until I was sequenced for landing.

On departure, again VFR, I was simply told "fly runway heading," (runway 28) which also happened to be my desired outbound course. Controllers turned me left momentarily to allow passage of a *Citation* which had taken off behind me. Once back on course, I stayed there, receiving traffic advisories—again, no unknowns.

The trip back through the Dulles TRSA was much the same as before, except that during its busy afternoon hours, in the process of receiving the required traffic separation, I was vectored more than the morning trip. This resulted in a southeasterly detour, as I made way for "heavies" landing at Dulles.

LIST OF ARSA CANDIDATE LOCATIONS

Anchorage, AK

Birmingham, AL
Huntsville, AL
Mobile, AL
Montgomery, AL

Little Rock, AR

Phoenix, AZ
Tucson, AZ

Burbank, CA
Monterey, CA
Oakland, CA
Ontario, CA
Palm Springs, CA
Sacramento, CA
San Diego, CA
Santa Ana, CA

Colorado Springs, CO

Windsor Locks, CT

Daytona Beach, FL
Ft. Lauderdale, FL
Jacksonville, FL
Orlando, FL
Pensacola, FL
Tallahassee, FL
Tampa, FL
W. Palm Beach, FL

Columbus, GA
Macon, GA
Savannah, GA

Kahului, HI

Cedar Rapids, IA
Des Moines, IA

Boise, ID

Champaign, IL
Moline, IL
Peoria, IL
Rockford, IL
Springfield, IL

Evansville, IN
Fort Wayne, IN
Indianapolis, IN
South Bend, IN

Wichita, KS

Cincinnati, KY
Lexington, KY
Louisville, KY

Baton Rouge, LA
Lafayette, LA
Lake Charles, LA
Shreveport, LA

Baltimore, MD

Portland, ME

Flint, MI
Grand Rapids, MI
Kalamazoo, MI
Lansing, MI
Saginaw, MI

Gulfport, MS
Jackson, MS

Billings, MT

Charlotte, NC
Fayetteville, NC
Greensboro, NC
Raleigh, NC

Lincoln, NE
Omaha, NE

Atlantic City, NJ

Albuquerque, NM

Reno, NV

Albany, NY
Buffalo, NY
Islip, NY
Rochester, NY
Rome, NY
Syracuse, NY
White Plains, NY

Akron-Canton, OH
Columbus, OH
Dayton, OH
Toledo, OH
Youngstown, OH

Oklahoma City, OK
Tulsa, OK

Portland, OR

Allentown, PA
Erie, PA
Harrisburg, PA

San Juan, PR

Quonset Pt., RI

Charleston, SC
Columbia, SC
Greer, SC

Bristol, TN
Chattanooga, TN
Knoxville, TN
Memphis, TN
Nashville, TN

Abiline, TX
Amarillo, TX
Austin, TX
Beaumont, TX
Corpus Christi, TX
Lubbock, TX
Midland, TX

Salt Lake City, UT

Chantilly, VA
Norfolk, VA
Richmond, VA
Roanoke, VA

Burlington, VT

Spokane, WA
Tacoma, WA

Green Bay, WI
Madison, WI
Milwaukee, WI

Charleston, WV

DALLAS/FT. WORTH—Fire Department training exercise where "victims" of a high-rise fire are rescued by helicopter. Currently this kind of external load operation may be conducted only with a waiver of the FARs. Photo courtesy Bell Helicopter Textron.

SMALL PLANES MAY GET SHOULDER HARNESS AT ALL SEATS

FAA is considering a rule that would require the installation and use of shoulder harnesses in newly manufactured normal, utility, and acrobatic category airplanes seating nine or less. The proposal would take effect one year after enactment of the final rule.

Pilots-in-command would be required to brief passengers on how to use the shoulder harnesses and to assure that harnesses and safety belts are fastened prior to takeoff and landing.

The rule change would affect all airplanes made in the United States as well as those imported from foreign manufacturers. Current regulations require shoulder harnesses only for the front seats and that they be worn only by the crew. However, members of the General Aviation Manufacturers Association have been voluntarily installing shoulder harnesses at all seats in general aviation airplanes since January 1, 1985 (January/February 1985 "Briefs").

A copy of the shoulder harness NPRM may be obtained free from FAA's Office of Public Affairs, APA-430, 800 Independence Ave., S.W., Washington, D.C. 20591. Comments should be sent in duplicate to the Office of the Chief Counsel, AGC-204, Docket No. 23815, same street address, as soon as possible.

CHILD SEAT USE IN AIRPLANES

FAA has released some user guidelines for people planning to use approved child or infant seats in aircraft. (Approved seats are those manufactured since January 1, 1981 which meet Federal motor vehicle safety standards.) Their use in aircraft is optional, and anyone wishing to attach an auxilliary seat to an existing aircraft seat must have approval from the pilot in command.

The weight of the child seat, as well as the child, should be included in preflight weight and balance calculations. The seat should be used in accordance with the manufacturer's instructions.

The child seats should not be in the front or "cockpit" area of small aircraft, to prevent interference with free movement of the controls. Child seats should not be attached to side-facing airplane seats during takeoff and landing. Similarly, the child seat should not be placed near an entry door or emergency exit. In an emergency, parents should take only the child, not the child and seat attachment, since the latter could become jammed in the exit.

For additional details contact AC 91-62, "Use of Child/Infant Seats in Aircraft," free from DOT Distribution Unit, M-494.3, Washington, D.C. 20590.

WIND SHEAR ALERTS INSTALLED

Three more low-level wind shear alert systems have been installed—in Tuscon, AZ; San Francisco, CA; and Honolulu, HI. Forty-eight more are planned for 1985, bringing the total in use by early 1986 to 110.

ROTORCRAFT RULE CHANGES

FAA is proposing some rule changes that will align airman certification, operational, and maintenance rules for rotorcraft with those for airplanes. The changes would update regulatory material to reflect modern rotorcraft technology and relax some previously restrictive sections.

Among the significant changes are establishment of a "Class D" for external load operations (which includes moving persons) and identification of critical components in rotorcraft service life.

For those interested in commenting, copies of Notice of Proposed Rulemaking No. 85-5 may be obtained free from FAA's Office of Public Affairs, APA-430, 800 Independence Ave., S.W., Washington, D.C. 20591. Comments should be sent in duplicate to the Office of the Chief Counsel, AGC-204, Docket No. 24550, same street address, no later than July 10, 1985.

For further information contact Roger Baker, FAA Operations Branch, AFO-820, same street address; (202) 426-8194.

NEW RULE ON ALCOHOL/DRUG ABUSE

Rules pertaining to the use of alcohol and drugs by pilots and other crewmembers have been toughened. In addition to the current eight-hour "bottle to throttle" requirement FAR § 91.11 will now state that no one may act as a crew member of a civil aircraft (1) while "under the influence" of alcohol; (2) while using any drug that impairs performance; or (3) while having .04 percent by weight or more of alcohol in the blood.

FAA is also accepting comments (until July 16, 1985) on a supplemental proposal which would require pilots or other crewmembers to submit to alcohol tests requested by law enforcement officials. Copies of NPRM 81-9A are free from FAA, APA-430, 800 Independence Ave., SW, Washington, DC 20591. Comments should be sent to FAA, AGC-204, Docket No. 21956, same street address.

Alcohol consumption figures in about 40 aircraft accidents a year, almost all of which are fatal.

LOW ACTIVITY VFR TOWER SERVICES TO BE CONTRACTED TO PRIVATE SECTOR

Services at 22 low-activity air traffic control towers may be handled by private contractors by October 1, 1985 as FAA goes through with some cost-saving measures. The towers whose services will be supplied by contractors are non-radar facilities that provide takeoff and landing clearance for primarily VFR operations. About one hundred thirty federal and non-federal towers may be contracted to private concerns over the next decade.

Fourteen of the 22 airports are now operated by the FAA:

South Lake Tahoe, CA	Hagerstown, MD
Salinas, CA	Worchester, MA
Aspen, CO	Ann Arbor, MI
Pocatello, ID	Greenville, MS
Bloomington, IL	Kinston, NC
Bloomington, IN	Lebanon, HN
Dubuque, IA	Wheeling, WV

The remaining eight—now either temporarily closed or operated by non-federal controllers—are Athens, GA; Valdosta, GA; Marion, IL; Paducah, KY; Benton Harbor, MI; Hobbs, NM; Akron-Fulton, OH; and Plainview, TX.

Eight more towers currently closed are also being surveyed to see if it is economically feasible to re-open the towers under private contract. They are: Hot Springs, AR; West Memphis, AR; Pine Bluff, AR; Marysville, CA; Fresno (Chandler Field), CA; Hickory, NC; Spartanburg, SC, and Knoxville, TN.

Pilots can anticipate no loss of services, and controllers will still be certificated by the FAA. Contracting is not planned for high-activity VFR towers or for radar-equipped towers.

• UFO Identified

Several people have wondered just what is that spiffy "unidentified flying object" on the January/February 1985 cover?

Mary Sutlovitch
Seattle, WA

It is a *Seawind*, a fiberglas kit-built amphib of Canadian origin, photographed on the transient ramp at Montgomery County Airpark in Gaithersburg, MD. Further information may be obtained from Seawind International, Box 878, Haliburton, Ontario, Canada, K0N 1S0.

• Hard on Software

I have recently bought a flight instructional software package for my personal computer. I was told by the software company that there was an article written about their product by G.A.N. in either the April or May 1983 issue.

Would you please send me any available issues for April and May 1983?

Steven J. Stone
Leduc, Alberta, Canada

FAA GENERAL AVIATION NEWS normally does not write articles on product information. A commercial publication called *General Aviation News* may be the source you are looking for. They may be reached at Box 1094, 2517 College Ave., Snyder, TX 79549.

Bear in mind when you use your software that as yet FAA has not approved any software package for instruction or flight simulation.

• VOR Receiver Error

Neither FAR § 91.25 (VOR equipment check for IFR operations) nor the Airman's Information Manual addresses the question of what, if anything, should be done with the bearing error found in a VOR receiver check when the error is within the tolerances allowed by regulation. Should the error be applied as a correction to the setting used in flying a prescribed radial or disregarded?

Name withheld

If the bearing error obtained during the VOR check is within the tolerances allowed (plus or minus 4° error for ground checks, plus or minus 6° for airborne checks), the error may be disregarded, since it holds true only for that particular point on the ground or in the air where the test was performed. Federal airways on VOR radials are configured with these tolerances in mind. If you, the pilot, made the VOR check, and it fell within the error allowed, you must enter the date of the test, place, and error in the aircraft logbook (or other record) and sign it. Of course, if the error is greater than the tolerances, no further IFR flight should be conducted, and the system should be checked as soon as possible by an avionics technician.

• CZ Comments

In your January/February 1985 issue you had an excellent article on control zones ["XYZ's of CZ's"], but I'd like to point out something that could be misleading.

First, on p. 7, you mention that a VFR pilot can transit the control zone without a special VFR clearance as long as he or she maintains VFR weather minimums for controlled airspace (3 miles visibility; cloud clearance: 500' below, 1,000' above, and 2,000' horizontally). To me, this could mean that a pilot could fly beneath a 900' ceiling as long as he or she stays 500' below the clouds.

George Williams
Oklahoma City, OK

The prohibition against flying VFR under a 1,000' ceiling is detailed elsewhere in the article. A pilot who did not read further might be misled, so in any subsequent reprints we will probably rearrange this information. Thank you.

• Concern over Corrections

At times I have noticed queries turning up several times in the "Forum" page before you come up with the right answer. As I don't understand why this happens, it causes me some consternation.

Lee Napoli
Florence, KY

Our procedure for obtaining correct and useful replies is as foolproof as we can make it, but being human we occasionally let something slip by. Normally all questions are taken up with appropriate experts in FAA Headquarters and elsewhere, and their comments are put together in a style that is clear and readable, as well as technically correct. The final version is approved by the experts before going to the printer. Once in a while something other than the finally approved version is inadvertently printed, in which case we notify the original writer by telephone and other readers in the next issue.

• CZ Criteria

The local hangar flight crew were discussing control zones recently when the correlation between control zones and airports with instrument approaches was reviewed. We discovered, to my surprise, that at least eight airports in Washington State have instrument approaches but no control zones! Some of the Minimum Descent Altitudes extend below the transition area into uncontrolled airspace where the instrument pilot can legally meet the VFR pilot in a one-mile and clear-of-clouds environment.

Will you please tell us the criteria used for establishment of a control zone?

Bill Taylor
Renton, WA

Control zones are established at airports to provide controlled airspace for instrument procedures. There are two criteria which the airport must meet: (1) a controlling ATC facility (on or off field) with two-way radio communications extending to the runway surface, and (2) Weather observing and reporting by a Federally certificated observer. (Note that once a control zone has been established by regulation, if the airport temporarily loses either required criteria, it is NOTAMed to that effect but retains its control zone.)

The condition you describe—arriving at your MDA in uncontrolled airspace—certainly demands extra pilot vigilance but is not an uncommon occurrence. For more detailed information on control zones, see the January/February 1985 issue, "XYZ's of CZ's."

FAA GENERAL AVIATION NEWS welcomes comments from our readers. No anonymous letters will be used, but names will be withheld on request. Address: FAA GENERAL AVIATION NEWS, AFO-807, Washington, D.C. 20591.

• Visiting Brits

I have a British private pilot certificate, and I'm going to be visiting the States for quite some time. Naturally, I do not wish to have my currency lapse. Could you advise me as to what I must do in order to fly here in America?

Simon Downing
Rochester, MN

Present your British pilot certificate and medical authorization to the nearest FAA flight standards district office. If you have an unrestricted British license, you should have no difficulty obtaining a U.S. private pilot certificate bearing the limitation, "Not Valid for Agricultural Aircraft Operations." To receive an unrestricted U.S. private pilot certificate, you must meet the necessary training and certification requirements in FAR Part 61 Subpart D. This may require some additional flight training, but your British flight time may be counted, if appropriate.

• Safety Pilot Medical

In the January/February 1984 "Forum" item "Unsafe Safety Pilot," you indicated that a safety pilot must be current and qualified for the aircraft and implied that the safety pilot needed a current medical as well. Then, in the September/October 1984 issue, you reiterated that by saying the safety pilot had to be current and qualified for the aircraft to act as PIC ("Safety Pilot Qualified," p. 15). I was under the impression that for situations where the safety pilot did not have to act as PIC (e.g., riding with an already-instrument rated pilot who is current and qualified for the airplane and conditions of flight), he or she did not need a current medical. What say you?

Name withheld

We agree. A safety pilot who does not act as a crewmember—as in the example you provided—does not need a current medical certificate.

INSTRUMENT CORNER

• Decision Height Penalties

In a recent discussion concerning inoperative components and remote altimeter settings, the question came up as to which penalty should be used to determine the appropriate approach minimums for an ILS in a situation where the middle marker was inoperative and the local altimeter setting was not available: the increase in the decision height for an inoperative component or the increase in decision height for a remote altimeter setting?

Donald A. DaDeppo
Tucson, AZ

The approach minimums adjustment for an inoperative component on an ILS is found in the "Inoperative Component and Visual Aids Table" of the instrument approach plate booklets. For a remote altimeter setting, the decision height is increased on the approach plate at least five feet for every mile greater than five miles that the reporting station is located from the airport of landing. In a case where you have both situations, combine the two penalties to arrive at an adjusted decision height.

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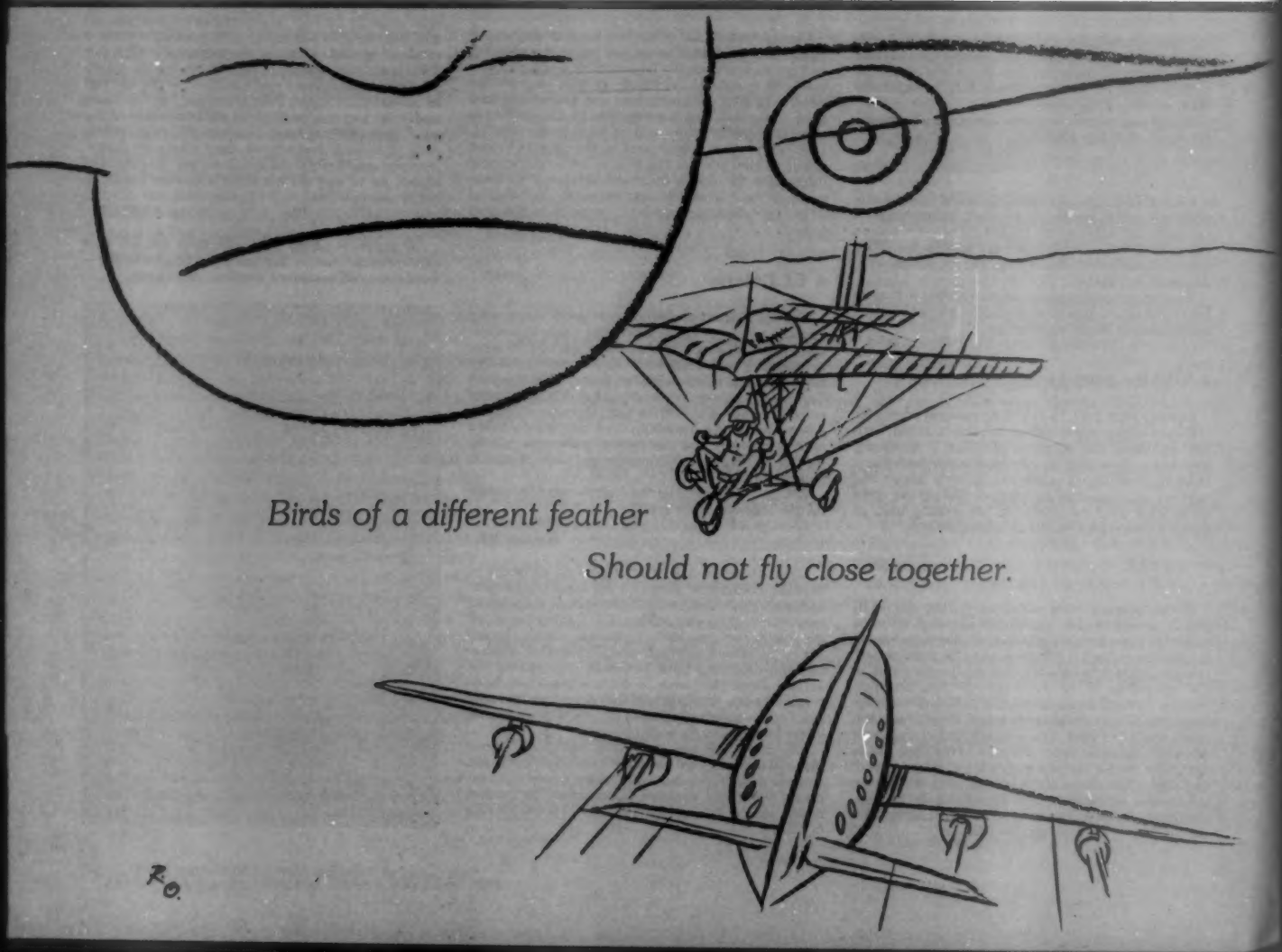
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